cicle appeared in 1900, so that four to eight years have elapsed since the various parts appeared. During this period the author says that local and visiting botanists have been extremely active in exploration, discovering new stations, plants new to Greece, and new species. All these additions have been brought together in this supplement, so that the *Conspectus* may be regarded as fairly complete again.—J. M. C.

Anatomy of dicotyledons.—The translation of the SOLEREDER'S *Systematische Anatomie der Dicotyledonen*[13] into English gave the author opportunity to revise the work and to add much supplementary matter. This has now been brought together at the instance of the German publisher for the benefit of those who have the original. This large *Erganzungsband* will be desirable for all those libraries that have the first two volumes, for it contains an immense amount of material. Besides the additional data, the concluding remarks have necessarily been revised. —C. R. B.

NOTES FOR STUDENTS

Sieve tubes in Laminariales.—Miss SYKES[14] has investigated the anatomy and histology of Macrocystis and Laminaria, chiefly *M. pyrifera* and *L. saccharina*. A few other species, such as *Sacchariza bulbosa*, *Laminaria digitata*, *Alaria esculenta*, and *Nereocystis Luetkeana*, were also examined to supplement the main results. Chief attention was paid to the morphological nature of the trumpet hyphae and of the true sieve tubes, the presence or absence of protoplasmic connecting threads, the development of sieve plates, and the nature of callus.

Some of the conclusions may be summarized as follows: (1) The trumpet hyphae in *M. pyrifera* and *L. saccharina* are to be looked upon as true sieve tubes. They represent the original central cells of the thallus modified, and may be termed primary pith filaments. Though they differ as to their degree of development, they are certainly homologous with the secondary sieve tubes of Macrocystis, which are similarly derived from the modified primary cortex of the young thallus. (2) It is believed that the histology of the sieve plates in the primary pith filaments and secondary sieve tubes is essentially the same. Threads are formed traversing the young sieve plates, and each gives rise in the older plate, apparently by means of ferment action, to a slime string inclosed in a rod of callus. In Macrocystis each original thread first divides to form a group, and each thread of a group forms its own callus rod, but finally, by fusion, only one slime string is produced from each group. The older sieve plates are obliterated by the deposition of a large mass of callus over their surface, and callus is also formed throughout the length of the old sieve tubes. (3) The callus is to be looked upon as a

[13] SOLEREDER, H., Systematische Anatomie der Dicotyledonen. Ein Handbuch für Laboratorien der wissenschaftlichen und angewandten Botanik. Erganzungsband. Imp. 8vo. pp. viii+422. Stuttgart: Ferdinand Enke. 1908.

[14] SYKES, M. G., Anatomy and histology of *Macrocystis pyrifera* and *Laminaria saccharina*. Annals of Botany **22**:291–325. *pls. 19–21*. 1908.

hydrated form of cellulose, and is found in *L. saccharina* and *L. digitata* in various states of hydration. It appears to be produced in the young sieve plates by the action of a ferment on the already formed cell wall, but is afterward accumulated by deposition from the protoplasm, both on the surface of the sieve plate and on the lateral walls of the tube. (4) The histology of the sieve tubes agrees with that of spermatophytes. The only contrast between the method of obliteration of the sieve tubes in Laminariaceae and Pinus is that in the latter the heads of the slime strings are still visible on the free edge of the callus cushions, and the path of the slime strings can be traced throughout the callus mass; while in Macrocystis and Laminaria the callus is laid down by the protoplasm of the sieve tubes over the heads of the slime strings, so that they are buried by the overlying callus and no perforations can be traced through the rod. (5) The protoplasmic connecting threads throughout the tissue of *M. pyrifera* and *L. saccharina* were demonstrated, but it is impossible to be certain of their formation in case of secondary attachment.—S. YAMANOUCHI.

Primitive angiosperms.—Miss SARGENT has developed more fully her view as to the origin of the monocotyledons,[15] which was stated formally in 1903. The present paper of course deals with the characters of primitive angiosperms, but this is a necessary corollary to the recently developed phylogenetic position of monocotyledons. It is an abstract of a course of eight lectures delivered for the London University about a year ago, and even then leaves the discussion of the origin of the flower to the recent paper by ARBER and PARKIN.[16] It is impossible to discuss the numerous lines of evidence presented and the inferences drawn from them. In general it may be said that facts are treated with a free hand and not always critically, that they are often related to one another with great boldness, and that the conclusions are in some cases more evident than the proofs.

Reasons for believing in the monophyletic origin of angiosperms are first presented, and with the recent development of our knowledge of vascular anatomy, it is questionable whether there exists today any serious objection to this view. And yet, perhaps it is well to have the situation summarized for us.

The reconstruction of the primitive race of angiosperms is based chiefly upon floral structure, stem anatomy, and number of cotyledons. The outcome is a plant with a strobiloid flower (as Magnolia), with a cambium, and with two cotyledons. A comparative study of pteridophytes, gymnosperms, and angiosperms would seem to make the last two conclusions inevitable, and the first at least partially true.

The real contention of the author, however, is the origin of the monocotyledonous condition. There is a very full discussion of all possible alternatives,

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[15] SARGENT, ETHEL, The reconstruction of a race of primitive angiosperms. Annals of Botany **22**:121–186. *figs. 21.* 1908.

[16] ARBER, E. A. N., and PARKIN, J., On the origin of angiosperms. Jour. Linn. Soc. Bot. **38**:29–80. 1907. See BOT. GAZETTE **44**:389. 1907.